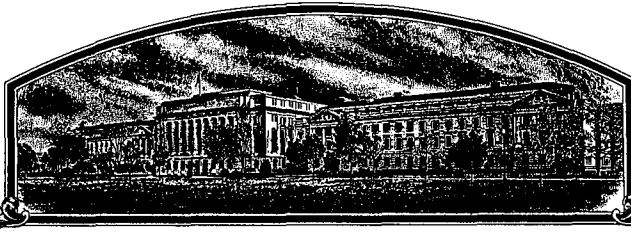


No.



9500067

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Larry and Lucyle Eckler

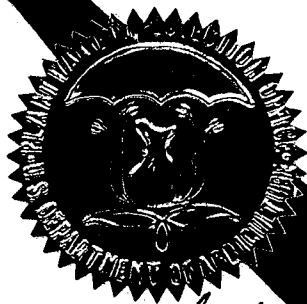
Whereas, THERE HAS BEEN PRESENTED TO THE
Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN

'Laser'



In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this 30th day of August in the year of our Lord one thousand nine hundred and ninety-six.

Attest:

Marsha A. Henton
Commissioner

Plant Variety Protection Office
Agricultural Marketing Service

Samuel H. Hinton
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE DIVISION

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(INSTRUCTIONS ON REVERSE)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) (as it is to appear on the Certificate) <u>Larry & Lucyle Eckler</u>		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO. <u>EXP-1</u>		3. VARIETY NAME <u>Laser</u>	
4. ADDRESS (street and no. or R.F.D. no., city, state, and ZIP) <u>1879 Barron Lake Rd</u> <u>Niles MI 49120-9358</u>		5. PHONE (include area code) <u>616-683-2509</u>		FOR OFFICIAL USE ONLY VPPO NUMBER <u>9500067</u> Date <u>1/3/95</u> Time <input type="checkbox"/> A.M. <input type="checkbox"/> P.M. Filing and Examination Fee: \$ <u>2325.00</u> Date <u>1/3/95</u> Certificate Fee: \$ <u>300.00</u> Date <u>July 10, 1996</u>	
6. GENUS AND SPECIES NAME <u>Zea-mays</u>		7. FAMILY NAME (Botanical) <u>Gramineae</u>			
8. CROP KIND NAME (Common Name) <u>Miniature Indian Corn</u>		9. DATE OF DETERMINATION <u>Sept 12 1992</u>			
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.)					
11. IF INCORPORATED, GIVE STATE OF INCORPORATION		12. DATE OF INCORPORATION			
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS					

Same as abovePHONE (include area code): Same

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse)		17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?	
a. <input checked="" type="checkbox"/> Exhibit A, Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B, Novelty Statement c. <input checked="" type="checkbox"/> Exhibit C, Objective Description of Variety d. <input checked="" type="checkbox"/> Exhibit D, Additional Description of Variety e. <input checked="" type="checkbox"/> Exhibit E, Statement of the Basis of Applicant's Ownership f. <input checked="" type="checkbox"/> Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office <u>12-30-94</u> g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,325) made payable to "Treasurer of the United States"		<input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED	
15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See section 83(a) of the Plant Variety Protection Act) <input type="checkbox"/> YES (If "YES," answer items 16 and 17 below) <input checked="" type="checkbox"/> NO (If "NO," skip to item 18 below)			
16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input type="checkbox"/> NO		17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED	
18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.? <input type="checkbox"/> YES (If "YES," through <input type="checkbox"/> Plant Variety Protection Act <input type="checkbox"/> Patent Act. Give date: _____). <input checked="" type="checkbox"/> NO			
19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES? <input type="checkbox"/> YES (If "YES," GIVE NAMES OF COUNTRIES AND DATES) _____ <input checked="" type="checkbox"/> NO			

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT [Owner(s)] <u>Larry M. Eckler</u>	CAPACITY OR TITLE <u>owner</u>	DATE <u>12-30-94</u>
SIGNATURE OF APPLICANT [Owner(s)] <u>Lucyle K. Eckler</u>	CAPACITY OR TITLE <u>owner</u>	DATE <u>12-30-94</u>

14A. Exhibit A: Origin and Breeding History

Laser is derived from cross breeding the originally discovered ear (a plain white with stripes ear) with an indian corn variety called Carousel. This cross resulted in more color variation with a stable striping pattern. A second cross between Carousel and the breeder seed created a better color spectrum in the aleurone layer and still maintained a strong red stripe pattern in the pericarp layer. Laser has maintained a high percentage of its stable striping pattern in each of its plantings.

Exhibit A: Origin and Breeding History

1) Genealogy

The original ear that led to the development of the Laser variety was discovered in a field of the Carousel variety. This ear was a plain white with red stripes ear and was a spontaneous mutation. The mutation was similar to Carousel in height; however, the overall appearance of the ear was markedly different.

Laser has since been derived by crossing the original parent ear with the ornamental Indian corn variety Carousel. This cross resulted in more color variation with a stable striping pattern.

2) Subsequent Stages

A second cross between the breeder seed and Carousel created an even better color spectrum in the aleurone layer and still maintained a strong red stripe in the pericarp layer. At this point selections for seed to be saved were of individual ears that manifested desired traits. These traits include: a strong striping pattern, ear length, ear diameter, and colors in the aleurone layer.

3) Frequency and Description of Variants

There is one known variant of Laser. It is an occasional solid red ear. This variant shows itself about 5% of the time. These all red ears tend to occur early in the harvest season due to the fact that they are the first to dry and are therefore the first to be harvested. This variant is fairly predictable and is commercially acceptable.

4) Uniformity and Stability

The Laser variety has been observed over four generations for uniformity and stability.

Uniformity - Laser is a very uniform variety with only one known variant as described above.

Stability - Laser is a very stable variety. The striping pattern has been maintained through seed reproduction throughout the last four generations.

Exhibit B: Novelty Statement

Laser is most similar to two other ornamental corn varieties, Stripes and Carousel.

Stripes exhibits a weaker striping pattern on the ear and less kernels actually containing the stripes. A planting of Stripes results in about a 30% repeat pattern (3 out of 10 ears would contain some striping). A planting of Carousel containing bicolor patterns yields a low repeating pattern (less than 5% carry any type of striping pattern). In our trials, Laser had 8 out of 10, 9 out of 10, and 10 out of 10 stalks bearing the striped pattern on its ears. Laser has a more defined striping pattern overall with more kernels containing the stripes per ear (about 90% or more).

The striping in Laser is most similar to the red stripe pattern in Stripes; however, the repeating of the pattern in Laser is about 90% (compared to 30% in Stripes).

Carousel tends to have some calico striping which is lighter in definition and in more of a spray/fan type stripe than the more defined red stripe in Laser. The stripes in Carousel also tend to be more orange in color than the red stripe in Laser.

Laser contains about 90% pointed kernels. Neither Carousel or Stripes kernels resemble this shape.

Laser would be the first miniature Indian corn variety to have a reliable design pattern when planted. The striping pattern in Laser is more defined and much easier to see than in either of the Stripes or Carousel varieties.

9500067

FORM GR-470-28
(9-1-92)EXHIBIT C
(Corn; Maize)United States Department of Agriculture, Agricultural Marketing Service
Commodities Scientific Support Division, Plant Variety Protection Office
National Agricultural Library Building, Room 500
Beltsville, MD 20705OBJECTIVE DESCRIPTION OF VARIETY
CORN (*Zea mays* L.)

Larry & Lucyle Eckler

Name of Applicant(s)

Variety Seed Source

Variety Name or Temporary Designation

1879 Barron Lk Rd

Breeder Seed

Laser

Address (Street & No., or R.F.D. No., City, State, Zip Code and Country)

FOR OFFICIAL USE I
PVPO Number

Niles MI 49120 9358 USA

Place the appropriate number that describes the varietal characters typical of this inbred variety in the spaces below. Right justify whole numbers by adding leading zeroes if necessary. Completeness should be striven for to establish an adequate variety description. Traits designated by a '*' are considered necessary for an adequate variety description and must be completed.

COLOR CHOICES (Use in conjunction with Munsell color code to describe all color choices; describe #25 and #26 in Comments section):

01=Light Green	05=Pale Yellow	11=Pink	15=Pale Purple	21=Buff
02=Medium Green	07=Yellow	12=Light Red	17=Purple	22=Tan
03=Dark Green	08=Yellow-Orange	13=Cherry Red	18=Colorless	23=Brown
04=Very Dark Green	09=Salmon	14=Red	19=White	24=Bronze
05=Green-Yellow	10=Pink-Orange	15=Red & White	20=White Capped	25=Variegated (Describe)
				26=Other (Describe)

STANDARD INBRED CHOICES (Use the most similar (in background and maturity) of these to make comparisons based on grow-out trial data):

Yellow Dent Families:

Family	Members
B14	CM105, A632, B64, B68
B37	B37, B76, H84
B73	N192, A679, B73, NC268
C103	Mo17, Va102, Va35, A682
Oh43	A619, MS71, H99, Va26
WF9	W64A, A554, A654, Pa91

Yellow Dent (Unrelated):

Col09, ND246,
Oh7, T232
W117, W153R
W182BN

White Dent:

C166, H105, Ky228

Sweet Corn:

C13, Iowa5125, P39, 2132

Popcorn:

SB1533, 4722, HP301, HP7211

Pipcorn:

Mo15W, Mo16W, Mo24W

1. TYPE: (describe intermediate types in Comments section)

* 6 1=Sweet 2=Dent 3=Flint 4=Flour 5=Pop 6=Ornamental 7=Pipcorn

Standard Inbred Name Carosel

2. REGION WHERE DEVELOPED IN THE U.S.A.:

* 2 1=Northwest 2=Northcentral 3=Northeast 4=Southeast 5=Southcentral
6=Southwest 7=OtherStandard Seed Source mallemas

3. MATURITY (In Region of Best Adaptability; show Heat Unit formula in "Comments" section):

DAYS	HEAT UNITS	
* 64	1932	From emergence to 50% of plants in silk
* 69	2072	From emergence to 50% of plants in pollen
10	119	From 10% to 90% pollen shed
(*)		From 50% silk to optimum edible quality
46	494	From 50% silk to harvest at 25% moisture

DAYS	HEAT UNITS
64	1932
69	2072
10	119
46	494

4. PLANT:

		Standard Deviation	Sample Size		Standard Deviation	Sample Size
* 253.9	cm Plant Height (to tassel tip)	11.0	15	201.9	21.6	10
* 132.8	cm Ear Height (to base of top ear node)	12.4	15	112.9	19.0	10
12.3	cm Length of Top Ear Internode	1.87	15	12.3	1.87	10
0	Average Number of Tillers	0	15	0	0	10
* 1.9	Average Number of Ears per Stalk	.46	15	1.2	.48	10
2	Anthocyanin of Brace Roots: 1=Absent 2=Faint 3=Moderate 4=Dark			4		

Application Variety Data

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Standard Inbred Data

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5. LEAF:			Standard Deviation	Sample Size				Standard Deviation	Sample Size
*	<u>6.6</u> cm Width of Ear Node Leaf	<u>0.72</u>	<u>15</u>		<u>6.1</u>	<u>1.71</u>	<u>10</u>		
*	<u>92.1</u> cm Length of Ear Node Leaf	<u>8.67</u>	<u>15</u>		<u>73.2</u>	<u>8.35</u>	<u>10</u>		
*	<u>4.4</u> Number of leaves above top ear	<u>0.74</u>	<u>15</u>		<u>4.1</u>	<u>0.32</u>	<u>10</u>		
	<u>32.2</u> degrees Leaf Angle (measure from 2nd leaf above ear at anthesis to stalk above leaf)	<u>21.95</u>	<u>15</u>		<u>47.3</u>	<u>23.82</u>	<u>10</u>		
*	<u>02</u> Leaf Color (Munsell code <u>56Y 6/10</u>)				<u>03</u> (Munsell code <u>56Y 5/10</u>)				
	<u>1</u> Leaf Sheath Pubescence (Rate on scale from 1=none to 9=like peach fuzz)				<u>1</u>				
	<u>6</u> Marginal Waves (Rate on scale from 1=none to 9=many)				<u>2</u>				
	<u>2</u> Longitudinal Creases (Rate on scale from 1=none to 9=many)				<u>2</u>				
6. TASSEL:			Standard Deviation	Sample Size				Standard Deviation	Sample Size
*	<u>15</u> Number of Primary Lateral Branches	<u>3.66</u>	<u>15</u>		<u>15</u>	<u>3.47</u>	<u>10</u>		
	<u>59.2</u> Branch Angle from Central Spike	<u>17.77</u>	<u>15</u>		<u>51.4</u>	<u>15.54</u>	<u>10</u>		
*	<u>42.2</u> cm Tassel Length (from top leaf collar to tassel tip)	<u>5.00</u>	<u>15</u>		<u>33.4</u>	<u>5.04</u>	<u>10</u>		
	<u>6</u> Pollen Shed (Rate on scale from 0=male sterile to 9=heavy shed)				<u>6</u>				
	<u>5</u> Anther Color (Munsell code <u>5Y 8/10</u>)				<u>5</u> (Munsell code <u>5Y 8/8</u>)				
	<u>6</u> Glume Color (Munsell code <u>5Y 8/8</u>)				<u>6</u> (Munsell code <u>5Y 8/6</u>)				
	<u>1</u> Bar Glumes (Glume Bands): 1=Absent 2=Present				<u>1</u>				
7a. EAR (Unhusked Data):									
*	<u>5</u> Silk Color (3 days after emergence) (Munsell code <u>5Y 8/6</u>)				<u>6</u> (Munsell code <u>5Y 8/4</u>)				
	<u>2</u> Fresh Husk Color (25 days after 50% silking) (Munsell code <u>56Y 5/10</u>)				<u>2</u> (Munsell code <u>56Y 5/10</u>)				
	<u>22</u> Dry Husk Color (65 days after 50% Silking) (Munsell code <u>2.5Y 8/4</u>)				<u>22</u> (Munsell code <u>2.5Y 8/4</u>)				
*	<u>1</u> Position of Ear at Dry Husk Stage: 1=Upright 2=Horizontal 3=Pendent				<u>1</u>				
	<u>3</u> Husk Tightness (Rate on scale from 1=very loose to 9=very tight)				<u>5</u>				
	<u>1</u> Husk Extension (at harvest): 1=Short (ears exposed) 2=Medium ((8 cm) 3=Long (8-10 cm beyond ear tip) 4=Very Long (>10 cm)				<u>2</u>				
7b. EAR (Husked Ear Data):			Standard Deviation	Sample Size				Standard Deviation	Sample Size
*	<u>12.5</u> cm Ear Length	<u>1.40</u>	<u>20</u>		<u>12.5</u>	<u>1.53</u>	<u>10</u>		
*	<u>27.5</u> mm Ear Diameter at mid-point	<u>2.35</u>	<u>20</u>		<u>28.9</u>	<u>1.52</u>	<u>10</u>		
	<u>68.0</u> gm Ear Weight	<u>20.07</u>	<u>15</u>		<u>45.0</u>	<u>11.30</u>	<u>10</u>		
*	<u>14</u> Number of Kernel Rows	<u>2.14</u>	<u>20</u>		<u>15</u>	<u>1.69</u>	<u>10</u>		
	<u>2</u> Kernel Rows: 1=Indistinct 2=Distinct				<u>2</u>				
	<u>2</u> Row Alignment: 1=Straight 2=Slightly Curved 3=Spiral				<u>2</u>				
	<u>7.3</u> cm Shank Length	<u>2.95</u>	<u>15</u>		<u>4.9</u>	<u>1.71</u>	<u>10</u>		
	<u>2</u> Ear Taper: 1=Slight 2=Average 3=Extreme				<u>2</u>				

Application Variety Data

Standard Inbred Data

Note: Use chart on first page to choose color codes for color traits.

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Application Variety Data

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Standard Inbred Data

Application Variety Data		Standard Inbred Data	
8. KERNEL (Dried):			
Standard Deviation	Sample Size	Standard Deviation	Sample Size
7.9 mm Kernel Length	.59 15	7.0	1.05 10
5.3 mm Kernel Width	.70 15	5.3	.67 10
2.7 mm Kernel Thickness	.46 15	2.9	.74 10
50.2 % Round Kernels (Shape Grade)	4.13 100 10 groups	44.8	7.97 100 10
2 Aleurone Color Pattern: 1=Homozygous 2=Segregating		2	
(*) 26 Aleurone Color (Munsell code Assorted)		26	(Munsell code Assorted)
* 19 Hard Endosperm Color (Munsell code 5y 8/4 mostly white, some yellow or pale yellow)		19	(Munsell code 5y 8/2 mostly white, some pale yellow)
* 3 Endosperm Type: 1=Sweet (su1) 2=Extra Sweet (sh2) 3=Normal Starch 4=High Amylose Starch 5=Waxy Starch 6=High Protein 7=High Lysine 8=Super Sweet (se) 9=High Oil 10=Other		3	
9.7 gm Weight per 100 Kernels (unsized sample)	1.98 15	8.4	0.66 10
9. COB:			
Standard Deviation	Sample Size	Standard Deviation	Sample Size
* 17.9 mm Cob Diameter at mid-point	1.34 15	16.8	.97 10
19.22 Cob Color (Munsell code 7.5y 8/4 (white))		19	(Munsell code 7.5y 8/6)
10. DISEASE RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant); leave blank if not tested; leave Race or Strain Options blank if polygenic):			
A. Leaf Blights, Wilts, and Local Infection Diseases			
<input type="checkbox"/> Anthracnose Leaf Blight (<i>Colletotrichum graminicola</i>) <input type="checkbox"/> Common Rust (<i>Puccinia sorghi</i>) <input type="checkbox"/> Common Smut (<i>Ustilago maydis</i>) <input type="checkbox"/> Eyespot (<i>Kabatiella zeae</i>) <input type="checkbox"/> Goss's Wilt (<i>Clavibacter michiganense</i> spp. <i>nebraskense</i>) <input type="checkbox"/> Gray Leaf Spot (<i>Cercospora zeae-maydis</i>) <input type="checkbox"/> Helminthosporium Leaf Spot (<i>Bipolaris zeicola</i>) Race _____ <input type="checkbox"/> Northern Leaf Blight (<i>Exserohilum turcicum</i>) Race _____ <input type="checkbox"/> Southern Leaf Blight (<i>Bipolaris maydis</i>) Race _____ <input type="checkbox"/> Southern Rust (<i>Puccinia polysora</i>) <input type="checkbox"/> Stewart's Wilt (<i>Erwinia stewartii</i>) <input type="checkbox"/> Other (Specify) _____		Race _____ Race _____ Race _____	
B. Systemic Diseases			
<input type="checkbox"/> Corn Lethal Necrosis (MCMV and MDMV) <input type="checkbox"/> Head Smut (<i>Sphacelotheca reiliana</i>) <input type="checkbox"/> Maize Chlorotic Dwarf Virus (MCDV) <input type="checkbox"/> Maize Chlorotic Mottle Virus (MCMV) <input type="checkbox"/> Maize Dwarf Mosaic Virus (MDMV) Strain _____ <input type="checkbox"/> Sorghum Downy Mildew of Corn (<i>Peronosclerospora sorghi</i>) <input type="checkbox"/> Other (Specify) _____		Strain _____	
C. Stalk Rots			
<input type="checkbox"/> Anthracnose Stalk Rot (<i>Colletotrichum graminicola</i>) <input type="checkbox"/> Diplodia Stalk Rot (<i>Stenocarpella maydis</i>) <input type="checkbox"/> Fusarium Stalk Rot (<i>Fusarium moniliforme</i>) <input type="checkbox"/> Gibberella Stalk Rot (<i>Gibberella zeae</i>) <input type="checkbox"/> Other (Specify) _____			
D. Ear and Kernel Rots			
<input type="checkbox"/> Aspergillus Ear and Kernel Rot (<i>Aspergillus flavus</i>) <input type="checkbox"/> Diplodia Ear Rot (<i>Stenocarpella maydis</i>) <input type="checkbox"/> Fusarium Ear and Kernel Rot (<i>Fusarium moniliforme</i>) <input type="checkbox"/> Gibberella Ear Rot (<i>Gibberella zeae</i>) <input type="checkbox"/> Other (Specify) _____			

Application Variety Data

Standard Inbred Data

Note: Use chart on first page to choose color codes for color traits.

Application Variety Data	Page 4	Standard Inbred Data
11. INSECT RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant); leave blank if not tested):		
— Banks Grass Mite (<i>Oligonychus pratensis</i>) — Corn Earworm (<i>Helicoverpa zea</i>) Leaf-Feeding Silk Feeding : — mg larval wt. — Ear Damage — Corn Leaf Aphid (<i>Rhopalosiphum maidis</i>) — Corn Sap Beetle (<i>Carpophilus dimidiatus</i>) — European Corn Borer (<i>Ostrinia nubilalis</i>) 1st Generation (Typically Whorl Leaf Feeding) 2nd Generation (Typically Leaf Sheath-Collar Feeding) Stalk Tunneling : — cm tunneled/plant — Fall Armyworm (<i>Spodoptera frugiperda</i>) Leaf-Feeding Silk-Feeding : — mg larval wt. — Maize Weevil (<i>Sitophilus zeamais</i>) — Northern Rootworm (<i>Diabrotica barberi</i>) — Southern Rootworm (<i>Diabrotica undecimpunctata</i>) — Southwestern Corn Borer (<i>Diatraea grandiosella</i>) Leaf Feeding Stalk Tunneling : — cm tunneled/plant — Two-spotted Spider Mite (<i>Tetranychus urticae</i>) — Western Rootworm (<i>Diabrotica virgifera virgifera</i>) — Other (Specify) _____	Standard Deviation Sample Size	Standard Deviation Sample Size
12. AGRONOMIC TRAITS:		
7 Stay Green (at 65 days after anthesis) (Rate on a scale from 1=worst to 9=excellent.) — 0. — % Dropped Ears (at 65 days after anthesis) — 0. — % Pre-anthesis Brittle Snapping — 0. — % Pre-anthesis Root Lodging — 0. — % Post-anthesis Root Lodging (at 65 days after anthesis) X — — — Kg/ha Yield of Inbred Per Se (at 12-13% grain moisture)		6 — 0. — — 0. — — 0. — — 0. — — 0. —
13. MOLECULAR MARKERS: (0=data unavailable; 1=data available but not supplied; 2=data supplied)		
0 Isozymes	0 RFLP's	0 RAPD's

REFERENCES:

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- Sprague, G.F., and J.W. Dudley (Editors). 1988. Corn and Corn Improvement, Third Edition. Agronomy Monograph 18. ASA, CSSA, SSSA, Madison, WI.
- Stringfield, G.H. Maize Inbred Lines of Ohio. Ohio A.E.S., Bul. 831. 1959.
- U.S. Department of Agriculture. 1936, 1937. Yearbook.

COMMENTS (eg. state how heat units were calculated, standard inbred seed source, and/or where data was collected. Continue in Exhibit D):

Heat units were supplied by M.F. Ag. Stat. Service in their weekly Newsletter for our Area.

Growing degree days (GDD) is the sum of daily mean temperatures minus 50 per day, 86 maximum and 50 minimum. The GDD is accumulative from April 1, 1994

Crop weather

9500067

FORM GR-470-28
(9-1-92)EXHIBIT C
(Corn; Maize)

United States Department of Agriculture, Agricultural Marketing Service
Commodities Scientific Support Division, Plant Variety Protection Office
National Agricultural Library Building, Room 500
Beltsville, MD 20705

OBJECTIVE DESCRIPTION OF VARIETY
CORN (*Zea mays* L.)

Name of Applicant(s) Larry & Lucyle Eckler	Variety Seed Source Breeder Seed	Variety Name or Temporary Designation Laser
Address (Street & No., or R.F.D. No., City, State, Zip Code and Country) 1879 Barron Lake Rd Niles, MI 49120 9358 USA		FOR OFFICIAL USE 1 PVPO Number

Place the appropriate number that describes the varietal characters typical of this inbred variety in the spaces below. Right justify whole numbers by adding leading zeroes if necessary. Completeness should be striven for to establish an adequate variety description. Traits designated by a '*' are considered necessary for an adequate variety description and must be completed.

COLOR CHOICES (Use in conjunction with Munsell color code to describe all color choices; describe #25 and #26 in Comments section):

01=Light Green	05=Pale Yellow	11=Pink	16=Pale Purple	21=Buff
02=Medium Green	07=Yellow	12=Light Red	17=Purple	22=Tan
03=Dark Green	08=Yellow-Orange	13=Cherry Red	18=Colorless	23=Brown
04=Very Dark Green	09=Salmon	14=Red	19=White	24=Bronze
05=Green-Yellow	10=Pink-Orange	15=Red & White	20=White Capped	25=Variegated (Describe)
				26=Other (Describe)

STANDARD INBRED CHOICES (Use the most similar (in background and maturity) of these to make comparisons based on grow-out trial data):

Yellow Dent Families:

Family	Members
B14	CM105, A632, B64, B68
B37	B37, B76, H84
B73	N192, A679, B73, NC268
C103	Mo17, Va102, Va35, A682
Oh43	A619, MS71, H99, Va26
WF9	W64A, A554, A654, Pa91

Yellow Dent (Unrelated):

Col09, ND246,
Oh7, T232
W117, W153R
W182BN

White Dent:

CI66, H105, Ky228

Sweet Corn:

CI3, Iowa5125, P39, 2132

Popcorn:

SG1533, 4722, HP301, HP7211

Pipecorn:

Mo15W, Mo16W, Mo24W

1. TYPE: (describe intermediate types in Comments section)			Standard Inbred Name STRIPES		
* <u>1</u> =Sweet <u>2</u> =Dent <u>3</u> =Flint <u>4</u> =Flour <u>5</u> =Pop <u>6</u> =Ornamental <u>7</u> =Pipcorn			6		
2. REGION WHERE DEVELOPED IN THE U.S.A.:			Standard Seed Source CORNS, CARL BARN		
* <u>1</u> =Northwest <u>2</u> =Northcentral <u>3</u> =Northeast <u>4</u> =Southeast <u>5</u> =Southcentral <u>6</u> =Southwest <u>7</u> =Other			6		
3. MATURITY (In Region of Best Adaptability; show Heat Unit formula in "Comments" section):					
DAYS HEAT UNITS			DAYS HEAT UNITS		
* <u> </u> <u> </u> <u> </u> From emergence to 50% of plants in silk			<u>64</u> <u>1937</u>		
* <u> </u> <u> </u> <u> </u> From emergence to 50% of plants in pollen			<u>69</u> <u>2072</u>		
<u> </u> <u> </u> <u> </u> From 10% to 90% pollen shed			<u>40</u> <u>119</u>		
*) <u> </u> <u> </u> <u> </u> From 50% silk to optimum edible quality			<u> </u> <u> </u>		
<u> </u> <u> </u> <u> </u> From 50% silk to harvest at 25% moisture			<u>46</u> <u>494</u>		
4. PLANT:	Standard Deviation	Sample Size	Standard Deviation	Sample Size	
* <u> </u> <u> </u> <u> </u> cm Plant Height (to tassel tip)	<u> </u>	<u> </u>	<u>237.6</u>	<u>21.94</u>	<u>10</u>
* <u> </u> <u> </u> <u> </u> cm Ear Height (to base of top ear node)	<u> </u>	<u> </u>	<u>123.1</u>	<u>22.67</u>	<u>10</u>
<u> </u> <u> </u> <u> </u> cm Length of Top Ear Internode	<u> </u>	<u> </u>	<u>16.1</u>	<u>4.21</u>	<u>10</u>
<u> </u> <u> </u> Average Number of Tillers	<u> </u>	<u> </u>	<u>0</u>	<u>0</u>	<u>10</u>
* <u> </u> <u> </u> Average Number of Ears per Stalk	<u> </u>	<u> </u>	<u>1.6</u>	<u>.70</u>	<u>10</u>
<u> </u> <u> </u> Anthocyanin of Brace Roots: 1=Absent 2=Faint 3=Moderate 4=Dark	<u> </u>	<u> </u>	<u>4</u>		
Application Variety Data			Standard Inbred Data		

Application Variety Data

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Standard Inbred Data

5. LEAF:				Standard Deviation	Sample Size					Standard Deviation	Sample Size
*	___	cm Width of Ear Node Leaf	___	___	___	6.2	_.95	10			
*	___	cm Length of Ear Node Leaf	___	___	___	8.3.6	9.11	10			
*	___	Number of leaves above top ear	___	___	___	4.1	.32	10			
	___	degrees Leaf Angle (measure from 2nd leaf above ear at anthesis to stalk above leaf)	___	___	___	68.6	47.5	10			
*	___	Leaf Color (Munsell code _____)	___	___	___	0.2	(Munsell code 5GY 6/10)				
	___	Leaf Sheath Pubescence (Rate on scale from 1=none to 9=like peach fuzz)	___	___	___	1					
	___	Marginal Waves (Rate on scale from 1=none to 9=many)	___	___	___	7					
	___	Longitudinal Creases (Rate on scale from 1=none to 9=many)	___	___	___	4					
6. TASSEL:				Standard Deviation	Sample Size					Standard Deviation	Sample Size
*	___	Number of Primary Lateral Branches	___	___	___	15.7	4.24	10			
	___	Branch Angle from Central Spike	___	___	___	49.7	11.33	10			
*	___	cm Tassel Length (from top leaf collar to tassel tip)	___	___	___	40.0	5.91	10			
	___	Pollen Shed (Rate on scale from 0=male sterile to 9=heavy shed)	___	___	___	6					
	___	Anther Color (Munsell code _____)	___	___	___	5	(Munsell code 5Y 8/10)				
	___	Glume Color (Munsell code _____)	___	___	___	6	(Munsell code 5Y 8/8)				
	___	Bar Glumes (Glume Bands): 1=Absent 2=Present	___	___	___	1					
7a. EAR (Unhusked Data):											
*	___	Silk Color (3 days after emergence) (Munsell code _____)	___	___	___	5	(Munsell code 5Y 8/6)				
	___	Fresh Husk Color (25 days after 50% silking) (Munsell code _____)	___	___	___	2	(Munsell code 5GY 5/10)				
	___	Dry Husk Color (65 days after 50% Silking) (Munsell code _____)	___	___	___	2.2	(Munsell code 2.5Y 8/14)				
*	___	Position of Ear at Dry Husk Stage: 1=Upright 2=Horizontal 3=Pendent	___	___	___	1					
	___	Husk Tightness (Rate on scale from 1=very loose to 9=very tight)	___	___	___	4					
	___	Husk Extension (at harvest): 1=Short (ears exposed) 2=Medium ((8 cm) 3=Long (8-10 cm beyond ear tip) 4=Very Long (>10 cm)	___	___	___	2					
7b. EAR (Husked Ear Data):				Standard Deviation	Sample Size					Standard Deviation	Sample Size
*	___	cm Ear Length	___	___	___	12.6	2.57	10			
*	___	mm Ear Diameter at mid-point	___	___	___	32.9	3.6	10			
	___	gm Ear Weight	___	___	___	58.0	10.1	10			
*	___	Number of Kernel Rows	___	___	___	15.6	3.10	10			
	___	Kernel Rows: 1=Indistinct 2=Distinct	___	___	___	2					
	___	Row Alignment: 1=Straight 2=Slightly Curved 3=Spiral	___	___	___	2					
	___	cm Shank Length	___	___	___	4.87	2.79	10			
	___	Ear Taper: 1=Slight 2=Average 3=Extreme	___	___	___	2					

Application Variety Data

Standard Inbred Data

Note: Use chart on first page to choose color codes for color traits.

Application Variety Data

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Standard Inbred Data

Application Variety Data		Standard Deviation	Sample Size	Standard Inbred Data	
8. KERNEL (Dried):					
___	mm Kernel Length	___	___	2.9	10
___	mm Kernel Width	___	___	5.	10
___	mm Kernel Thickness	___	___	2.6	___
___	% Round Kernels (Shape Grade)	___	___	49.8	100.00%
___	Aleurone Color Pattern: 1=Homozygous 2=Segregating	___	___	2	___
(*)	Aleurone Color (Munsell code ___)	___	___	2.6	(Munsell code assorted - light ye)
*	Hard Endosperm Color (Munsell code ___)	___	___	2.6	(Munsell code 54 8/4 mostly ye some pale ye)
*	Endosperm Type: 1=Sweet (sul) 2=Extra Sweet (sh2) 3=Normal Starch 4=High Amylose Starch 5=Waxy Starch 6=High Protein 7=High Lysine 8=Super Sweet (se) 9=High Oil 10=Other	___	___	3	___
___	gm Weight per 100 Kernels (unsized sample)	___	___	9.45	10
9. COB:					
*	mm Cob Diameter at mid-point	___	___	18.8	10
___	Cob Color (Munsell code ___)	___	___	2.2	(Munsell code 7.5 yr 8/4)
10. DISEASE RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant); leave blank if not tested; leave Race or Strain Options blank if polygenic):					
A. Leaf Blights, Wilts, and Local Infection Diseases					
___	Anthraxnose Leaf Blight (<i>Colletotrichum graminicola</i>)	___	___	___	___
___	Common Rust (<i>Puccinia sorghi</i>)	___	___	___	___
___	Common Smut (<i>Ustilago maydis</i>)	___	___	___	___
___	Eyespot (<i>Kabatiella zeae</i>)	___	___	___	___
___	Goss's Wilt (<i>Clavibacter michiganense</i> spp. <i>nebraskense</i>)	___	___	___	___
___	Gray Leaf Spot (<i>Cercospora zeae-maydis</i>)	___	___	___	___
___	Helminthosporium Leaf Spot (<i>Bipolaris zeicola</i>)	Race	___	___	___
___	Northern Leaf Blight (<i>Exserchilum turcicum</i>)	Race	___	___	___
___	Southern Leaf Blight (<i>Bipolaris maydis</i>)	Race	___	___	___
___	Southern Rust (<i>Puccinia polysora</i>)	___	___	___	___
___	Stewart's Wilt (<i>Erwinia stewartii</i>)	___	___	___	___
___	Other (Specify) _____	___	___	___	___
B. Systemic Diseases					
___	Corn Lethal Necrosis (MCMV and MDMV)	___	___	___	___
___	Head Smut (<i>Sphacelotheca reiliana</i>)	___	___	___	___
___	Maize Chlorotic Dwarf Virus (MCDV)	___	___	___	___
___	Maize Chlorotic Mottle Virus (MCMV)	___	___	___	___
___	Maize Dwarf Mosaic Virus (MDMV)	Strain	___	___	___
___	Sorghum Downy Mildew of Corn (<i>Peronosclerospora sorghi</i>)	___	___	___	___
___	Other (Specify) _____	___	___	___	___
C. Stalk Rots					
___	Anthraxnose Stalk Rot (<i>Colletotrichum graminicola</i>)	___	___	___	___
___	Diplodia Stalk Rot (<i>Stenocarpella maydis</i>)	___	___	___	___
___	Fusarium Stalk Rot (<i>Fusarium moniliforme</i>)	___	___	___	___
___	Gibberella Stalk Rot (<i>Gibberella zeae</i>)	___	___	___	___
___	Other (Specify) _____	___	___	___	___
D. Ear and Kernel Rots					
___	Aspergillus Ear and Kernel Rot (<i>Aspergillus flavus</i>)	___	___	___	___
___	Diplodia Ear Rot (<i>Stenocarpella maydis</i>)	___	___	___	___
___	Fusarium Ear and Kernel Rot (<i>Fusarium moniliforme</i>)	___	___	___	___
___	Gibberella Ear Rot (<i>Gibberella zeae</i>)	___	___	___	___
___	Other (Specify) _____	___	___	___	___

Application Variety Data

Standard Inbred Data

Note: Use chart on first page to choose color codes for color traits.

Butler, D.R. 1954. A System for the Classification of Corn Inbred Lines. PhD Thesis, Ohio State University.
Emerson, R.A., G.W. Beadle, and A.C. Fraser. 1935. A Summary of Linkage Studies in Maize. Cornell A.E.S., Mem. 180.
Farr, D.F., G.F. Bills, G.P. Chamuris, A.Y. Rossman. 1989. Fungi on Plant and Plant Products in the United States. The American Phytopathological Society, St. Paul, MN.
Inglett, G.E. (Ed.) 1970. Corn: Culture, Processing, Products. Avi Publishing Company, Westport, CT.
Jugenheimer, R.W. 1976. Corn: Improvement, Seed Production, and Uses. John Wiley & Sons, New York.
McGee, D.C. 1988. Maize Diseases. APS Press, St. Paul, MN. 150 pp.
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The Mutants of Maize. 1968. Crop Science Society of America. Madison, WI.
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Stringfield, G.H. Maize Inbred Lines of Ohio. Ohio A.E.S., Bul. 831. 1959.
U.S. Department of Agriculture. 1936. 1937. Yearbook.

COMMENTS (e.g. state how heat units were calculated, standard inbred seed source, and/or where data was collected. Continue in Exhibit-D):

14D. Exhibit D: Additional Description of Laser

Laser is an ornamental popcorn with a defined striping in the pericarp layer. Having the striping in the pericarp layer makes the pattern very stable. Pericarp characteristics are not affected by cross pollination from an outside source. The pericarp layer is directly related to and derived from the mother gene, meaning that whatever is present in the pericarp layer before planting will very likely be present after cross pollination.

The variety Stripes also has striping in the pericarp layer, but has a less defined pattern and less kernels containing the pattern than does Laser.

The overall ear size of Laser tends to be smaller than Stripes, but is slightly larger than Carousel.

The days to maturity of Laser appears to be the same as both Carousel and Stripes.

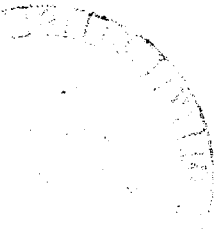
Laser contains several color pattern variations in the aleurone layer. It contains a variety of colors including: purples, pinks, blues, whites, browns, reds, and yellows. Stripes most often had the striping pattern occur with a yellow aleurone layer. A much lesser manifestation of the pattern with the other colors in the aleurone layer does occur.

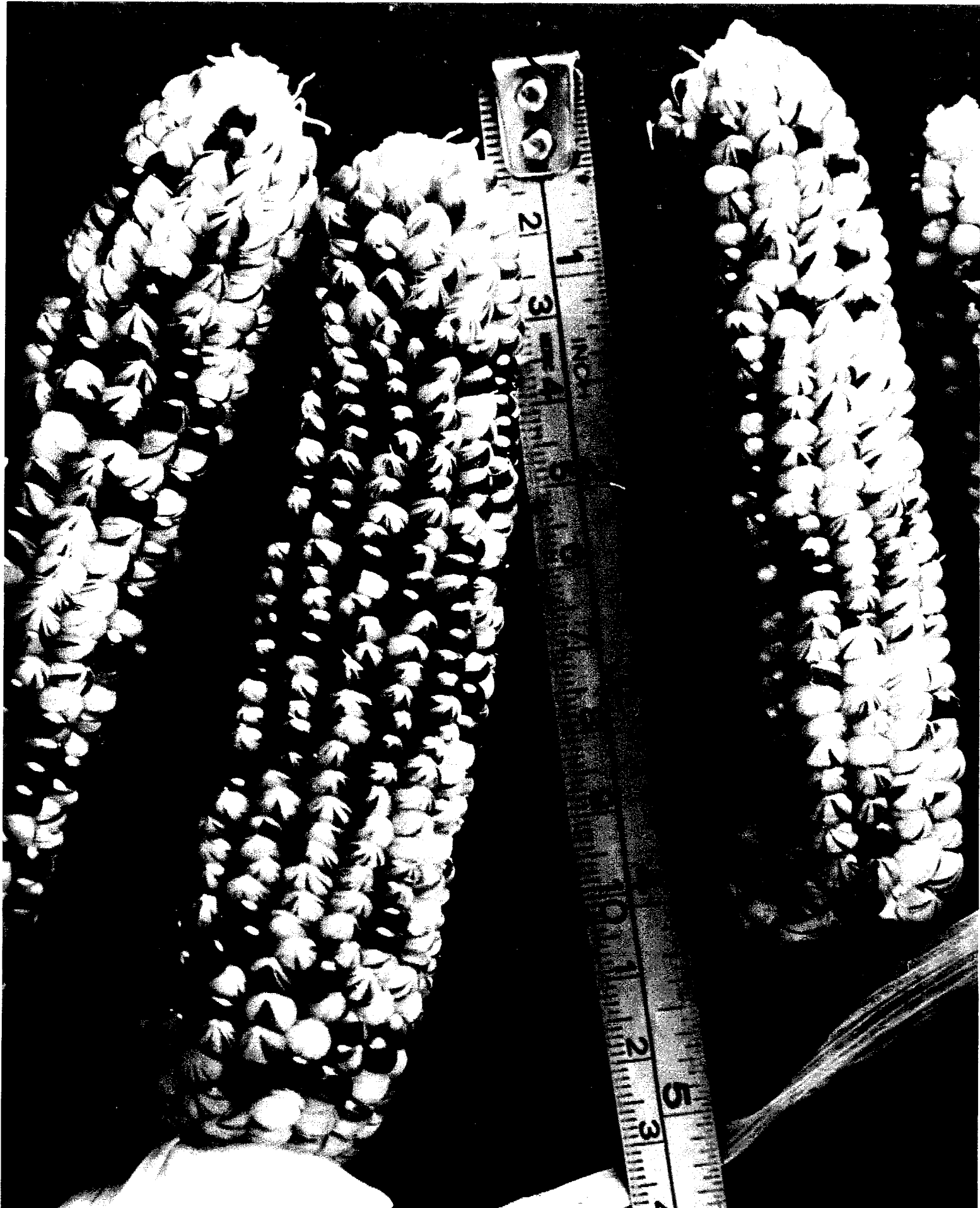
CONT:

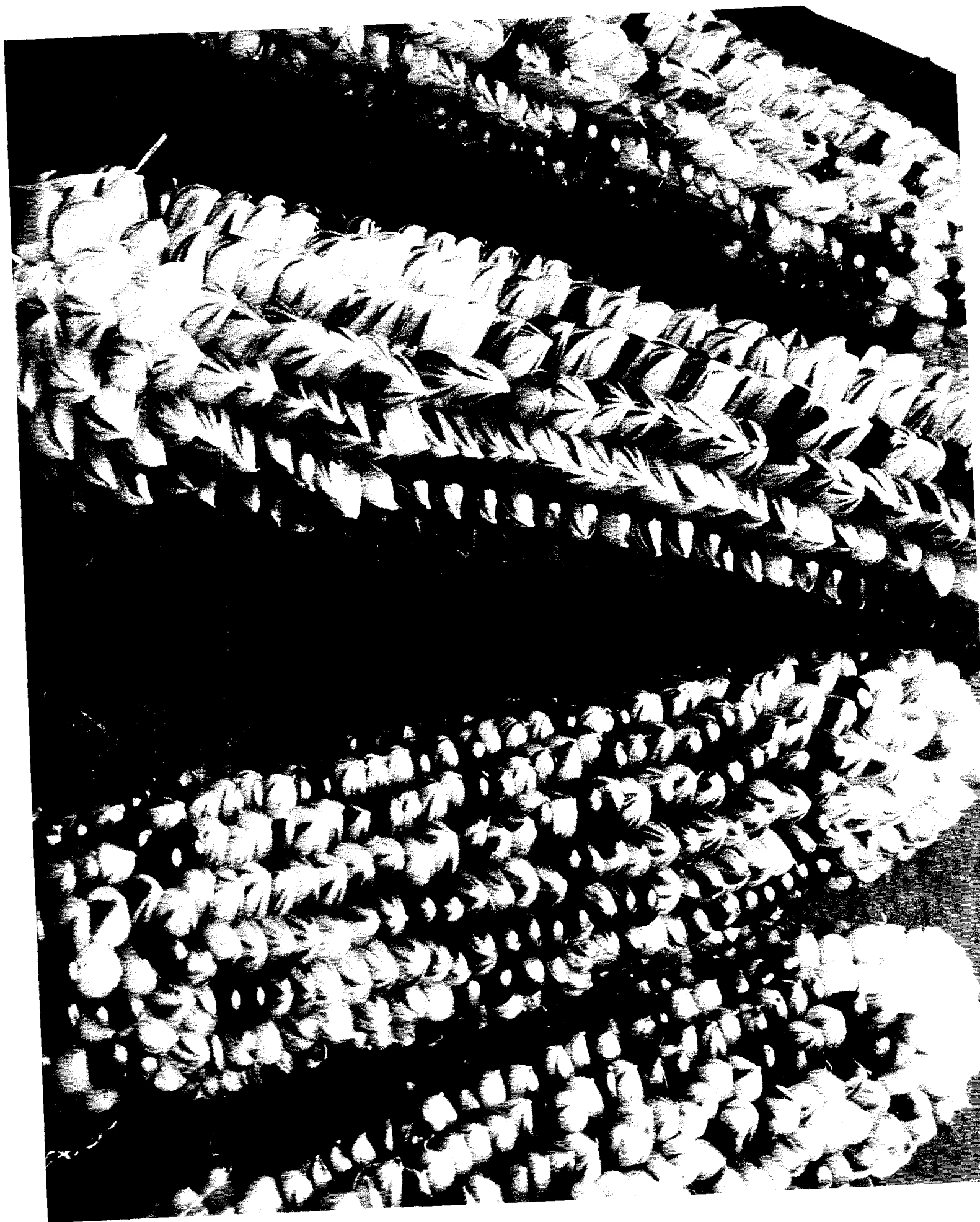
14D. EXHIBIT D: ADDITIONAL DESCRIPTION OF LASER

Laser has a distinctive dry silk color that makes it very easy to spot. The silks are of a lighter brown color. Laser and Stripes appear to have similar silk colors. Carousel has mostly darker silks.

Laser would be one of the first patterned design ornamental popcorn to have a reliable, repeating striped design pattern.

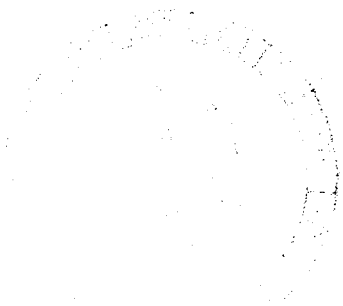






14E. Exhibit E: Statement of the Basis of Applicant Ownership

This variety has been known as Laser since the discovery of the first ear. It has been developed by Larry and Lucyle Eckler through the cross breeding of the saved discovery seed and the variety Carousel. Through several crosses this breeder seed has developed into a reliable and colorful design pattern in an ornamental popcorn type corn.



U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY DIVISION - PLANT VARIETY PROTECTION OFFICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) Larry & Lucyle Eckler	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER EXP-1	3. VARIETY NAME Laser
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) 1879 Barron Lake Road Niles, Michigan 49120-9358	5. TELEPHONE (include area code) (616) 683-2509	6. FAX (include area code) (616) 683-0928
7. PVPO NUMBER 9500067		

8. Does the applicant own all rights to the variety? Mark an "X" in appropriate block. If no, please explain.

☒ YES ☐ NO

9. Is the applicant (individual or company) a U.S. national or U.S. based company?
If no, give name of country _____

☒ YES ☐ NO

10. Is the applicant the original breeder? If no, please answer the following:

☒ YES ☐ NO

a. If original rights to variety were owned by individual(s):

Is (are) the original breeder(s) a U.S. national(s)? If no, give name of country _____

☐ YES ☐ NO

b. If original rights to variety were owned by a company:

Is the original breeder(s) U.S. based company? If no, give name of country _____

11. Additional explanation on ownership (If needed, use reverse for extra space): We discovered the original ear. It was unlike the variety it was growing with. We have developed it further into a unique marketable variety. No one else propagates this type of ornamental corn. Due to these factors we claim rights of ownership to this variety.

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original breeder, both the original breeder and the applicant must meet one of the above criteria.

The original breeder may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

Public reporting burden for this collection of information is estimated to average 10 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, AG Box 7630, Jamie L. Whitten Building, Washington, D.C. 20250. When replying, refer to OMB No. 0581-0055 and form number in your letter.

Under the PRA of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

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